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08/186269

Filed

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US005840299A

**United States Patent** [19]**Bendig et al.**[11] **Patent Number:** **5,840,299**[45] **Date of Patent:** **Nov. 24, 1998**[54] **HUMANIZED ANTIBODIES AGAINST LEUKOCYTE ADHESION MOLECULE VLA-4**[75] **Inventors:** **Mary M. Bendig**, London; **Olivier J. Léger**, Hertfordshire; **José Saldanha**, Enfield Middlesex; **S. Tarran Jones**, Radlett, all of United Kingdom; **Ted A. Yednock**, Fairfax, Calif.[73] **Assignee:** **Athena Neurosciences, Inc.**, South San Francisco, Calif.[21] **Appl. No.:** **561,521**[22] **Filed:** **Nov. 21, 1995****Related U.S. Application Data**

[63] Continuation-in-part of Ser. No. 186,269, which is a continuation-in-part of PCT/US95/01219 Jan. 25, 1995, abandoned.

[51] **Int. Cl.<sup>6</sup>** ..... **A61K 39/395**; C07K 16/28; C12P 21/08; C12N 15/13[52] **U.S. Cl.** ..... **424/133.1**; 424/130.1; 424/141.1; 424/143.1; 424/144.1; 424/153.1; 424/154.1; 424/173.1; 435/7.1; 435/7.2; 435/7.21; 435/7.24; 435/69.6; 435/172.3; 435/251.3; 435/320.1; 530/387.3; 530/388.73; 530/388.75; 530/388.22; 536/23.53[58] **Field of Search** ..... 424/130.1, 133.1, 424/141.1, 143.1, 144.1, 153.1, 154.1, 173.1; 435/69.6, 172.3, 252.3, 320.1, 7.1, 7.2, 7.21, 7.24; 536/23.4, 23.5, 23.53; 530/387.1, 387.3, 388.2, 388.22, 388.7, 388.73, 388.75[56] **References Cited****U.S. PATENT DOCUMENTS**5,260,210 11/1993 Rubin et al. .... 435/240.23  
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The invention provides humanized immunoglobulins that specifically bind to the VLA-4 ligand, and methods of treatment using the same. The methods are particularly useful for treatment of multiple sclerosis.

**29 Claims, 16 Drawing Sheets**